Jayendee Farms Agroforestry and Poplar Intercropping Demonstration

John Doppenberg and family own and operate **Jayendee Farms**, 20 acres in Abbotsford with a 300 sow, farrow-to-finish hog operation with approximately 2,500 animals on the farm. In order to utilize manure generated from the hog operation, 17 acres of the farm was planted to a short-rotation, intensive-culture hybrid poplar (*Populus* spp.) plantation in 2002. Hybrid poplars thrive in a nutrient-rich environment and can absorb and utilize high levels of soil nutrients. Although still experimental and exploratory, given the nutrient utilizing qualities of hybrid poplars they may be good candidates for improving manure management through agroforestry in intensively farmed regions such as the Fraser Valley.

The poplars at Jayendee are now in the beginning of the fifth growing season in what is expected to be an 8- to 12-year rotation to harvest. The trees are planted at a 14-foot spacing and the lower canopy has reached a height that allows for the planting of shade-tolerant plants in the understory. So, with diversification and sustainability of their operation in mind, Jayendee Farms, in partnership with the **Abbotsford Soil Conservation Association** and funding assistance from the **BC Agroforestry Industry Development Initiative**, is testing additional agroforestry options by introducing landscape and floral crops in the poplar alleys. In addition to demonstrating the sustainable utilization of hog manure with an agroforestry system, their new venture will determine optimum plant species for integration in a poplar plantation fertilized with hog manure, and will provide education to other producers through tours and awareness materials.

A key support and delivery partner in this demonstration is the Abbotsford Soil Conservation Association (ASCA). ASCA is a not-for-profit society "directed by farmers, for farmers and the community". The Association uses a cooperative approach in the development of sustainable land stewardship strategies that offer economical and effective solutions to issues related to soil conservation, water quality, and nutrient management. ASCA's goals are to promote the conservation of agricultural land in the City of Abbotsford for the benefit of present and future generations, and the long-term management of soil and water resources to enhance the productivity and profitability of agricultural lands. ASCA works with farmers across many sectors by undertaking education and outreach and delivering projects and programs in the Fraser Valley such as the Greenhouse Gas Mitigation Program and the BC Environmental Farm Plan Program. More information on ASCA and their projects can be found on their website: www.abbotsfordsoilconservation.com.

Planting of the alley crops at Jayendee is expected to begin in the fall of 2006 with harvesting of floral stock over the three subsequent years. The demonstration site will cover approximately 140-ft by140 ft (10 by 10 tree rows). Alley cropping will take place along the rows of poplar to allow for access of manure spreading equipment in the row centres. This will also allow for planting of a greater variety of plants. Based on initial consultations with members of the BC Landscape & Nursery Association, several plant species were chosen for testing including red osier dogwood (*Cornus sericea* and *C. stolonifera*) and Oregon grape (*Mahonia nervosa*), shrubs which are expected to thrive in the low light and high nutrient conditions. The remaining interior rows will be planted with shade-loving ferns such as northern maidenhair fern, lady fern and deer fern. The plants chosen have high value in floral and landscape markets and are expected to be readily marketable. In order to estimate the effects of manure application the floral and landscape stock will also be intercropped with poplars that receive no manure. A similar control for the effects of shade is planned, with an area of floral and landscape plants grown without

trees. Harvests of the alley crops are expected to begin in the growing season following planting and will continue until harvest of the hybrid poplars. The shrub/fern crops will be harvested by pruning or selective cutting rather than whole-plant removal. As the plants get bigger therefore, the total annual production is expected to increase over the duration of the project.

This project is expected to be completed at the early range of the poplar rotation of 8 to 12 years, with floral species selection and planting density to be reassessed at the end of the project in order to plan for future planting schemes. Through the life of the demonstration, it will develop valuable information to help hog and other intensive livestock operators assess the potential for agroforestry to meet their production and conservation goals. Some of the expected key outputs include:

- Development of a selection of floral and landscape species suitable for alley cropping with hybrid poplar with guidance from representatives from the BC Landscape & Nursery Association and BC Ministry of Agriculture and Lands;
- Measurement of the nutrient content of soil, foliage, bark, wood, and roots in relation to manure applied in order to estimate the whole-farm nutrient balance and the effects of agroforestry practices on the same;
- Identification of key distributors and buyers of floral and landscape products in the Fraser Valley.

In addition to the agroforestry system on the farm, the Doppenbergs are also establishing a composting facility based on the relatively new technology of biodrying. This method utilizes the potential energy in hog manure to remove moisture and stabilize nutrients at a relatively faster rate than conventional composting methods. Research has shown that biodrying can significantly reduce the water in the manure and because it is a composting process there is no methane produced. Moreover, there is also opportunity to separate ammonium from carbon, thus reducing the amount of nitrous oxide emissions. This method of composting is expected to produce a high quality fertilizer product after composting which may be tested on agroforestry system at a future date.

The agroforestry demonstration, along with the biodrying project, will provide an opportunity to increase interest in fully integrated sustainable farming systems. ASCA plans to produce fact sheets outlining the project outcomes and to increase awareness of the benefits of agroforestry. The fact sheets will highlight selected floral and landscape crops, planting schemes, yields and the whole-farm nutrient balance and will be targeted at intensive livestock producers and agroforestry practitioners, but will be relevant to others in which agroforestry systems could fit into their land management plans.

For more information on this project, please contact **Jayna Houston,** Coordinator at the Abbotsford Soil Conservation Association: Jayna@AbbotsfordSoilConservation.com